US Army Corps of Engineers®
Engineer Research and Development Center

Paint Technology Center

Purpose

The Paint Technology Center (PTC) supports the U.S. Army Corps of Engineers' painting activities by offering consultation, product testing, development of specifications (and specification testing), preparation of manuals and guide specifications, training, research, and inspection or management aids. The Center's two primary mission areas are the painting of steel structures at Corps of Engineers civil works installations, and the painting of the military infrastructure at Army and other DoD installations. The PTC helps facility engineers meet numerous coatings-related requirements in the field, including:

- paint system selection guidance
- specification of commercial coatings for military construction and civil works
- topcoating of in-place lead-based paint
- removal of lead-based paints from military facilities
- onsite inspections
- coating failure analysis and correction guidance
- PROSPECT courses and on-site paint schools
- routine paint testing.

Specifications

The PTC, located at the Construction Engineering Research Laboratory (CERL), Champaign, IL, maintains an extensive array of equipment, ranging from the common laboratory tools and supplies needed to perform routine paint testing, to the sophisticated electronic instrumentation required to perform research and development, and forensic-type studies. Raw materials and milling equipment for the manufacture of laboratory batches of paint, as well as gages and meters for the field evaluation of coatings, are kept available. The staff maintains a close relationship with the Steel Structures Painting Council, American Society for Testing and Materials, Tri-Services Paint Committee, National Association of Corrosion Engineers, and the University of Illinois. These relationships help to broaden the PTC's equipment and technology base to address the full range of needs in the field of painting technology.

The PTC helps provide coatings for Corps civil works projects.

Benefits

The PTC provides a wide range of assistance to Army, other government, and non-government interests, from fielding routine questions on paint specifications and use, to conducting on-site analyses of application problems and coating failures. Through consultation, researchers seek to clearly understand the problems encountered in the field and to best direct their research. This saves money because the it focuses the research on resolving field problems with practical, easily-applied solutions.

The PTC also develops paints for specialized uses. For example, research and development at the Center has helped to provide coatings that can be applied under water, eliminating the need for costly dewatering of structures. PTC research has yielded improved inspection techniques and standards. A paint test kit developed by CERL allows inspectors to run basic tests to determine the quality of paints in the field, thus reducing testing costs and time.

Success Stories

Research into vinyl coatings started shortly after the World War II to control corrosion on the new dams along the Mississippi River. Vinyl coatings, however, have a high solvent content, which has caused some U.S. localities to eliminate them. PTC researchers worked to establish a special category based on field data showing that vinyls outperform commercially available epoxy coatings in immersed abrasion areas by a factor of 4 to 5. Today, vinyl paint systems are used on virtually every fresh water lock, dam, and hydropower facility operated by the Corps.

Private industry developed and patented the technology for making the first coal tar epoxy in the early 1960s. Energy shortages of the early to mid 1970s resulted in short supplies of the special coal tar pitch. The Corps of Engineers, in cooperation with Society for Protective Coatings (SSPC) conducted additional research to develop a product based on a more available grade of pitch. The PTC worked with manufacturers to develop and test a compliant coal tar epoxy product, now used on virtually all salt water gates, sheet pilings, and buried structures throughout the Corps of Engineers.

Recently, the PTC worked together with Army and Navy representatives to unify Army and Navy painting guide specifications (CFGS 09900 and NFGS 09900). The resulting Unified Facilities Guide Specification (UFGS) 09900 (September 2001) allows the DOD and contractors to maintain and apply a single criteria document to all DOD facilities. The Center provides Headquarters with the technical input to Corps painting guide specifications for both military facilities (UFGS 09900) and civil works structures (UFGS 09965A); the metallizing guide specification (UFGS 09971A); and developed the Corps Paint Manual (EM-1110-2-3400).

The Paint Technology Center at CERL has been designated as a certified Support Center by Headquarters, U.S. Army Corps of Engineers. The Center currently receives an average of 600 calls a year from the public and private sector (most from COE Civil Works and Army installations) regarding paint testing, training, research, and inspection or management aids. In one case, the Fort Stewart, GA DPW requested help to determine whether the interior structural steel of a newly built warehouse would need to be painted. Since the material had already been coated with factory primer before assembly, and since the environment was relatively benign (interiors walls to be used for dry storage), the PTC determined that painting would be unnecessary. With periodic touch-up to cover scuffs and abrasions, the structural steel should remain in good condition for decades without a large added maintenance expense.

In another case, the National Institute for Standards and Testing (NIST, Gaithersburg, MD) required “real world” samples of lead-based paint to verify the accuracy of a new analytical method, “anodic stripping voltametry,” which can be used in the field to determine the lead content in paint samples (e.g., paint chips, dust, wipes, paint in soil). The PTC was able to call on its many DOD installation contacts to provide a wide range of field samples to help develop and verify the results of this important new field test.

Point of Contact

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